

NEW GENERA AND SPECIES OF AUSTRALIAN STONE-FLIES
(Order PERLARIA).

By R. J. TILLYARD, M.A., Sc.D. (Cantab.), D.Sc. (Sydney), F.N.Z.Inst.,
F.L.S., F.E.S., C.M.Z.S., Entomologist and Chief of the Biological
Department, Cawthron Institute, Nelson, N.Z.
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Family EUSTHENIIDAE.

Genus EUSTHENIOPSIS, Till.

Proc. Linn. Soc. N.S. Wales, 1921, xlvi., p. 232.

EUSTHENIOPSIS VENOSA, Till.

Subspecies *brachyptera*, n. subsp. A very distinct race or subspecies of this handsome Victorian species was discovered by me on Mount Kosciusko, N.S. Wales, in November, 1921. It differs from the type form in its small size and shortened wings, and in the lunule of the forewing being very narrow, less than 1 mm. wide. Length of forewing 12 mm., of hindwing 10 mm., of body 20 mm.; antennae 12 mm., cerci 11 mm. Purplish-blue colouring of hindwings not quite so rich as in type form. Both the specimens taken were males.

Types: Holotype male and paratype male (Mount Kosciusko, N.S. Wales, 5,500 feet, November 24, 1921, R. J. T.), in Cawthron Institute collection.

Genus THAUMATOPERLA, Till.

Proc. Linn. Soc. N.S. Wales, 1921, xlvi., p. 224.

THAUMATOPERLA ROBUSTA, Till.

A half-grown larva of this fine species has recently been taken by Mr. Erasmus Wilson in a mountain stream near Mount Bencairn, Millgrove, Victoria, where both male and female specimens of this rare insect have also been found by Mr. Wilson and Mr. C. G. Barrett. The larva is black, with the thoracic sterna, sutures, and coxae yellow, the femora tinged with olive-green beneath. A similar larva, full-fed and of great size (about 45 mm. long), was taken by me on Mount Kosciusko, N.S. Wales, in Nov., 1921; the underside had the yellow colouration replaced by brick-red. Thus we may conclude that either *T. robusta* itself, or a related, undescribed species, is to be found on Mount Kosciusko.

♂. Hitherto undescribed, differs from female as follows:—Total length of body 19 mm., forewing 18 mm., cerci 18 mm. The parts of the meso- and meta-thorax, coxae, and femora, which were described as either brown or greyish-yellow in the female, are bright yellow in the male. Seg. 9 hollowed out posteriorly above, broadly yellow on either side; tenth tergite narrowly yellow. Supra-anal plate with a forwardly curved copulatory hook, rather short; paraprocts short, blunt.

Types: Holotype female in National Museum, Melbourne; allotype male in Cawthron Institute collection, Nelson, N.Z.; both from Warburton, Vict.; male dated 4, 1915.

Family AUSTROPERLIDAE.

Genus TASMANOPERLA, Till.

Canadian Entomologist, 1921, p. 40.

The following new species, from Mount Kosciusko, N.S. Wales, has the characters of the genus clearly marked, but superficially resembles the New

Zealand *Austroperla cyrene* (Newm.) in the lack of any mottling of the wings and in the weakness of the cross-veins in part of the distal area of the forewings.

Tasmanoperla ruficosta, n. sp.

♀. Length of body 12 mm., of forewing 13 mm., antennae 9 mm., cerci 0.7 mm., with very few segments. Body, legs, and antennae black. Wings fuscous with black veins, except the whole of the costal space to end of R_1 in both wings, which is brick-red (fading to yellow-ochreous in dead specimens) with darker reddish-brown venation. Distal cross-veins between branches of Rs, M, and Cu_1 very weak, colourless, rest very strong and black.

Types: Holotype female and series of five paratypes, all apparently females (Mount Kosciusko, N.S. Wales, 5,500 feet, Nov. 24, 1921, R. J. T.), in Cawthron Institute collection, Nelson, N.Z. Two of the paratypes have slightly shortened wings, length of forewing being 11 mm.

Family LEPTOPERLIDAE.

Genus DINOTOPERLA, Till.

Canadian Entomologist, 1921, p. 43.

Dinotoperla fasciata, n. sp.

♀. Length of body 6 mm., of forewing 10 mm., antenna 7 mm., cerci 1 mm. Head black, antennae dark brown; pronotum pale yellowish; rest of thorax black, abdomen dark brown. Forewings suffused with pale fuscous, venation darker fuscous; distal cross-veins surrounded by darker fuscous areas and so arranged that from three to four irregular transverse fasciae cross that part of the wing. Hindwings darker fuscous with a few darkened cross-veins placed distally between C, R_1 , and Rs.

Types: Holotype female (National Park, Q'land, 1,500-2,000 feet., Dr. A. J. Turner), in Cawthron Institute collection, Nelson, N.Z.; paratype female, slightly smaller in size and with less distinct fasciae (same locality, Mar., 1921, G. H. Hardy), in Queensland Museum, Brisbane.

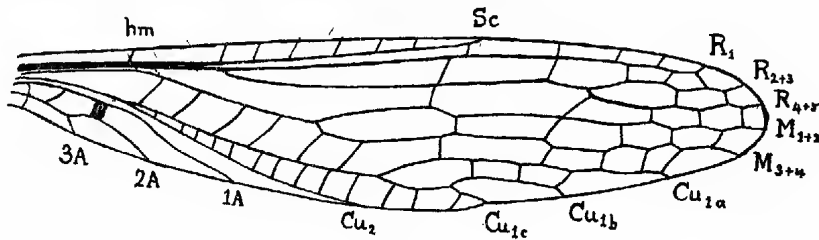


Fig. 1.

Forewing of *Trinotoperla irrorata*, n. g. et sp. Length, 25 mm. 1A, 2A, 3A, the three anal veins; Cu_{1a} , Cu_{1b} , Cu_{1c} , the three branches of first cubitus; Cu_2 , second cubitus; hm, humeral veinlet; M_{1+2} M_{3+4} , the two branches of media; R_1 main stem of radius; R_{2+3} R_{4+r} , the two branches of radial sector (Rs); Sc, subcosta.

Genus Trinotoperla, n. g.

Forewings with Rs forked distally, M forked near middle of wing, Cu_1 three-branched (sometimes in males the lowest branch is very short and forms a closed cell with the one above it); cubito-anal space without cross-veins; a thickened cross-vein between 1A and 2A. Hindwing with Rs distally forked, M forked, Cu_1 simple, or, more rarely, forked; apex narrowly rounded; anal fan rather narrow, without any cross-veins. Cerci short. Size of species large, expanding from 40 mm. to over 50 mm.

Genotype: *T. irrorata*, n. sp., from Mount Kosciusko, N.S. Wales.

Trinotoperla irrorata, n. sp.

♀. Length of body 20 mm., of forewing 25 mm., antennae 17 mm., cerci barely 3 mm. Body dark fuscous, marked with dull brown; antennae dull brownish with slight fuscous annulations; legs dull brownish varied with dark fuscous. Wings pale greyish with dark-fuscous veins, those of basal half of hindwing inclining to brownish; the whole of forewing and distal part of hindwing irrorated with darker spots and patches, and most of the cross-veins enclosed in darker areas. Forewing with a complete series of costal veinlets; hindwings with *hm* and three to four distal costal veinlets only. Thickened cross-vein between 1A and 2A in forewing blackish, very prominent.

♂. Smaller and slightly paler and less strongly irrorated than female. Body 17 mm., forewing 21 mm.; supra-anal plate with slender copulatory process directed upwards and ending in a small hook directed posteriad; paraprocts upcurved, forming two flatly rounded lobes directed forward and upward. Tenth tergite with a raised flap distally.

Types: Holotype female, allotype male, and paratype female (Mount Kosciusko, N.S. Wales, 5,000-5,500 feet, Nov. 24, 1921, R. J. T.), in Cawthron Institute collection, Nelson, N.Z.

Trinotoperla australis, n. sp.

♀. Length of body 14 mm., of forewing 20 mm., antennae 15 mm., cerci 2 mm. Body, legs, and antennae fuscous; metathorax, abdomen, and femora touched with brown. Wings pale brownish-fuscous, with darker venation and cross-veins enclosed in narrow darkened areas; no irroration present. Both wings with costal veinlets very incomplete, only *hm* and one or two distal costal veinlets being present. Thickened cross-vein between 1A and 2A of forewings inconspicuous, semi-transparent brownish.

Type: Holotype female (Towac, near Mount Canoblas, N.S. Wales, Oct. 7, 1916, R. J. T.), in Cawthron Institute collection, Nelson, N.Z.

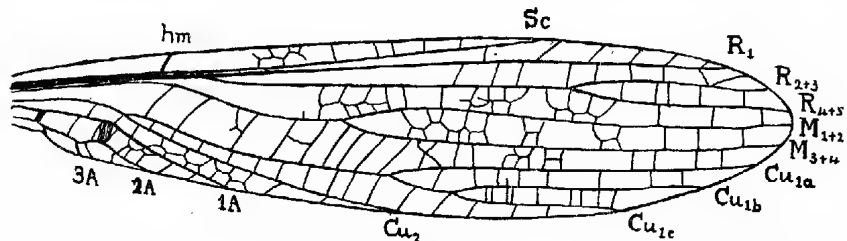


Fig. 2.

Forewing of *Eunotoperla kershawi*, n. g. et sp. Length, 25 mm. Lettering as in fig. 1.

Genus *Eunotoperla*, n. g.

Forewing with Rs distally forked or three-branched, M forked from near middle of wing, Cu₁ three-branched or, more rarely, simply forked; a thickened cross-vein between 1A and 2A; cells between M and Cu₁ partially double; cubito-anal space with cross-veins. Hindwing with Rs terminally forked or simple, M forked, Cu₁ forked or simple; apex well rounded; anal fan moderately wide, with a few weak cross-veins developed in region of 1A and 2A. Cerci short. Size of species large, expanding 50 mm. or more.

Genotype: *E. kershawi*, n. sp. (Vict.).

This genus shows an approach to the Eustheniidae in the beginning of the development of cross-veins on the anal fan, and is in other respects somewhat

similar in appearance to the genus *Stenoperla* of that family; it can be at once distinguished by the marked angle between the border of the anal fan and the rest of the hindwing, this angle being entirely absent in the Eustheniidae.

***Eunotoperla kershawi*, n. sp.**

♂. Length of body (abdomen much shrunken) 11 mm., of forewing 25 mm., antennae 16 mm., cerci 4 mm. Body, legs, and antennae blackish, with front border of pronotum brownish. Wings dull brownish with dark-brown venation; cross-veins nearly all enclosed in pale transparent whitish areas; thickened cross-vein between 1A and 2A of forewing dark brown; supra-anal plate with a copulatory process in the form of a slender, downcurved spine; paraprocts with a pair of shorter, upcurved spines.

♀. Length of body (not shrunken) 25 mm., forewing 30 mm.; differs from male in having abdomen and pronotum brown, wings dark brown, the hindwings somewhat fuscous.

Types: Holotype male and allotype female (Warburton, Vict., 12, 94), in National Museum, Melbourne; paratype male, from same locality, in Cawthron Institute collection, Nelson, N.Z., also a male from Thorpdale, Gippsland.

Dedicated to Mr. J. A. Kershaw, F.L.S., Curator of the National Museum, Melbourne.

Family NEMOURIDAE.

Genus SPANIOCERCA, Till.

Trans. N.Z. Inst., vol. liv., 1923, p. 216.

The family has not previously been recorded from Australia, but is represented by species of this New Zealand genus in Tasmania and on the mountains of South-eastern Australia. Pending a more comprehensive study of the species, which are small and closely similar, the following species from Mount Wellington, near Hobart, is here described.

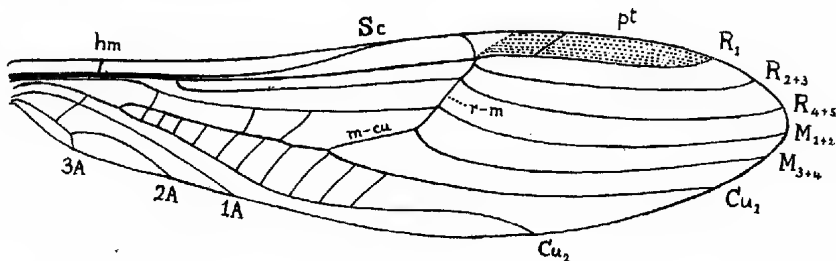


Fig. 3.

Forewing of *Spaniocerca tasmanica*, n. sp. Length, 10 mm. Lettering as in fig. 1, except Cu_1 , first cubitus; *m-cu*, medio-cubital cross-vein, and *r-m*, radio-medial cross-vein, both forming part of the transverse cord; *pt*, pterostigma.

***Spaniocerca tasmanica*, n. sp.**

♀. Length of body 11 mm., of forewing 10 mm., antennae 9 mm., cerci obsolete. Head black, with occiput rich brown; antennae blackish. Thorax blackish; legs dark brown, with conspicuous black marks at both ends of femora and tibiae; tarsi blackish. Wings shining, semi-transparent, suffused with pale brown; hindwing markedly iridescent. Pterostigma of both wings conspicuous, long (about 3 mm.), brown. Somewhat hyaline areas present in forewing just distad from transverse cord and also on either side of basal half of Cu_1 .

Types: Holotype female and allotype female (Mount Wellington, Tas., Jan. 31, 1917, R. J. T.), in Cawthron Institute collection, Nelson, N.Z.